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ABSTRACT

After the second semester of comparing college student performance in beginning courses in Century 21 shorthand and Gregg shorthand the following conclusions were made: Century 21 instruction produced a higher proportion of successes among students who speak a foreign language at home (Spanish); after two semesters of instruction, the attrition rates for Century 21 and Gregg were the same; and even though Century 21 students outperformed Gregg students overall in the first semester, Gregg students outperformed Century 21 students in the second semester and could take dictation at higher speeds. (A bibliography on shorthand prognosis, the proposal for the evaluation, and three questionnaires used to gather student data are included in this evaluation report. Results of the first, third, and final semester evaluations are presented in separate documents.) (BM)

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AN EVALUATION OF THE PROJECT:

PILOT COURSE IN CENTURY 21 SHORTHAND

Second Semester

July 1976

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

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OVERVIEW

CENTURY 21 vs. GREGG: THE FIRST TWO COLLEGE SEMESTERS

After two semesters of comparing college student performance in beginning courses in Century 21 Shorthand and Gregg Shorthand (Fall 1975, Spring 1976), we come to the following conclusions:

1. The statistics gathered in both semesters support the contention that Century 21 instruction produces a higher proportion of successes among students who speak a foreign language at home (Spanish) than does Gregg instruction.

2. Century 21 has a lower attrition rate in the first semester than Gregg, while the conditions are reversed in the second semester. The result is the same attrition rates for Century 21 and Gregg after two semesters of instruction.

3. There is better overall performance among Century 21 students in the first semester than for Gregg students; while in the second semester Gregg students outperform Century 21 students. After two semesters, Gregg students take dictation at speeds higher than do the Century 21 students.

The following qualifications must be made concerning the design of the project:

1. An experienced Gregg instructor was teaching the Gregg section, while the Century 21 students were taught by an instructor with very little experience with Century 21 and no experience in teaching it (although many years' experience in Gregg instruction).

2. The Gregg students were working with well-tested and often-revised textbooks and materials, while the Century 21 students were working with entirely new textbooks.

3. The vocabulary of the Century 21 materials is much more difficult than the Gregg materials. The words are more complex and more specialized in Century 21.

4. The texts in Century 21 are organized for instruction over a 3-semester sequence, while those for Gregg are organized for a 4-semester sequence. There are 200 speed forms that must be learned in Century 21, while only 133 brief forms must be learned in Gregg. Century 21 has an enriched vocabulary, while Gregg deals with a regular vocabulary. The net effect is that more material must be learned in a given period of time by Century 21 students than by Gregg students.

5. The organization of the materials in Century 21 is different from the organization of materials in the Gregg textbooks. In addition, the structure of the shorthand strokes is different for the two: in Century 21 all strokes go in the same direction, while in Gregg they do not.

Evaluation of the Project:

Pilot Course in Century 21 Shorthand

The discussion which follows includes statistical analyses of the performance of Century 21 students in comparison with that of Gregg students. The organization is the same as for the first report in this series (Heins, et al., 1976). Data was gathered from each student enrolled in the two sections utilizing the following forms (see Appendix):

Biographical Information

Career Education Description Questionnaire

Background Information Questionnaire

Background and Study Habits Questionnaire

ACT Scores and College GPAs as Recorded in NMSU Files

Teachers' Summary of Performance (Grade Book)

HOLDING POWER

The proportions of successful students in Century and in Gregg during the second semester (success = C- or better at the end of the term) were as follows:

GREGG A	GREGG B	CENTURY
6/10 = 60%	10/12 = 83.3%	8/14 = 57.1%

(Gregg B refers to the students who have completed a year or more of high school shorthand and have joined the Gregg A section at mid-year.) The proportion of successful for the entire year (two semesters) was as follows:

GREGG A	CENTURY
6/26 = 23.1%	8/35 = 22.9%

The proportion of successes in each course for the year (and each semester) is virtually identical.

The proportion of successful students among minorities is:

	GREGG A	GREGG B	CENTURY
SEMESTER	3/6 = 50.0%	2/3 = 66.7%	4/6 = 66.7%
YEAR	3/14 = 21.4%	- - -	4/16 = 25.0%

Century elicited more success for the second semester and for the year than did Gregg. The differences are not statistically significant, however, so they must be considered equal.

The proportion of successful students who speak a foreign language at home is:

	GREGG A	GREGG B	CENTURY
SEMESTER	2/4 = 50.0%	2/3 = 66.7%	2/3 = 66.7%
YEAR	2/13 = 15.4%	- - -	2/13 = 15.4%

The holding power for Century 21 for foreign language speakers is superior to Gregg in the second semester, but equal to Gregg over two semesters.

In comparison, the proportion of English-only students (which includes some Spanish-Americans as well as other minorities) who were successful is:

	GREGG A	GREGG B	CENTURY
SEMESTER	4/6 = 66.7%	8/9 = 88.9%	6/11 = 54.5%
YEAR	4/13 = 30.8%	- - -	6/22 = 27.2%

Gregg, the more traditional course, has greater holding power (yielding a larger success rate) than does Century, for English-only students. Again, however, the results are not statistically significant. The figures for the year are very close for Gregg and for Century.

Another measure of relative success is the proportion of students attaining relatively high dictation speeds. The following table shows the dictation speeds attained by the various groups:

TABLE I

NUMBER OF STUDENTS ATTAINING DICTATION SPEEDS (95% Accuracy) ON ONE OR MORE TESTS

Speed (wpm)	CENTURY (N=14) N	%	GREGG A (N=10) N	%	GREGG B (N=12) N	%
Below 60	4	28.6	4	40.0	2	16.7
60	2	14.3				
70	3	21.4	2	20.0		
80	2	14.3	2	20.0	3	25.0
90	3	21.4	1	10.0	5	41.7
100			1	10.0	2	16.7
Totals	14	100.0	10	100.0	12	100.0

The Gregg B students attained high dictation speeds (83.3% at 80 wpm or above, 58% at 90 wpm and above), while the Gregg A students were not quite as skilled (40% attained 80 wpm or above, 20% attained 90 wpm or above). Century 21, on the other hand, had 35.7% of its students attaining 80 wpm or more, and 21.4% attaining 90 wpm or more.

An important policy decision should be mentioned at this point. Since this was an experimental project, students were urged to continue a second semester in both Century 21 and Gregg A, even though they did not make a good enough grade (C or better) in the first semester. As a result, two borderline students (D+, C-) continued in the Gregg A section, and four borderline students continued in the Century 21 section. None of these six students achieved at a satisfactory level in the second semester. The result was that the proportion of successes for Century 21 was reduced disproportionately when compared with Gregg B. Without this effect, Gregg and Century would have been much closer to each other in the semester figures (Century usually had a slightly lower proportion of successes for the term). The overall rates, of course, would not be affected. This same disparity will show up in later figures which depend upon mean performances.

CONCLUSION

Century 21 and Gregg are very similar in holding power for minority students as well as for other students. Century had a slight advantage in holding power for minorities in each semester, while Gregg had a slight advantage for non-foreign language speakers in each semester. The two effects conterbalance in the yearly figures to give virtually identical holding power figures. The Gregg groups attained higher dictation speeds (40% and 83.3% of Gregg A and Gregg B, respectively, attained dictation speeds of 80 wpm or more, while 35.5% of the Century 21 students attained 80 wpm).

ANALYSIS OF VARIANCE

The mean performances were compared for the various shorthand sections: Gregg A = continuing students in Gregg; Gregg B = students joining the Gregg A class after completing a year or more of high school Gregg (or one semester of college Gregg) and Century 21 students continuing in a second semester.

This comparison was done in a series of two-way analyses of variance in which the groups were further subdivided as follows:

Foreign language speakers or not

High or low achievement on ACT tests:

English ACT (low = 1 - 17, high = 18+)

Math ACT (low = 1 - 10, high = 11+)

Overall ACT (low = 1 - 13, high = 14+)

These cut points were similar to cut points used in a study of performance in the first semester (Heins, et al., 1976). These values were chosen so as to assure adequate representation in each cell. A minimum of four in each cell was achieved, with an average of six or eight (for 2 x 2 and 2 x 3 analyses).

The measurements used as dependent variables in these analyses were the following shorthand performance measures:

Dictation Speed (average of five highest test scores expressed as percent of maximum: five takes at 90 wpm).

Theory Tests (average of four tests, expressed as percent).

Brief Form Tests (average of four tests, expressed as percent).

Overall Average (weighted average of above plus homework).

The overall average in these analyses was overwhelmingly weighted by the dictation speed (60%), while previous analyses of first semester performance weighted each sub-measure equally.

The results of the 28 analyses [12 analyses (2 x 3) involving shorthand classes and levels of ACT for the four shorthand measures; 12 analyses (2 x 2) involving language spoken and ACT levels; and four analyses (2 x 3) involving language spoken and shorthand classes] are listed below:

1. Gregg students perform in the shorthand measures at a significantly higher level ($p < .05$) than do Century students. This is particularly true for the Gregg B students who consistently outperform Century 21 students and usually outperform Gregg A students on all shorthand performance measures.

2. Students with high ACT English scores significantly outperform ($p < .01$) students with low ACT scores when Brief Forms is the dependent measure. The biggest difference is for Gregg A students, next for Century, and there is no difference between Gregg B students who have the highest average performance for both high and low ACT status. In no other measure does ACT English make a significant difference.

3. High ACT overall students outperform low ACT overall students ($p < .05$) when Brief Forms is the dependent measure. Again, the difference is between Gregg B and Century students.

4. No significant differences in performance on any measure is shown for ACT Math scores.

5. No significant differences in performance on any measure is shown for the dichotomy: Foreign Language spoken or not.

In the first semester study (Heins, et al., 1976) Mathematics ACT was found to be a significant variable in dictation performance and overall performance. This is in line with the results of Balsley (1975), Holderness (1976), and Handorf (1973), perhaps because the first semester emphasizes learning the shorthand symbols. For the second semester, Mathematics ACT was no longer important as a predictor; the emphasis has shifted to transcription where English skills are more important [Curley (1974), Kinsey (1970), Lambrecht (1972), Moskovis (1969), Reid (1974), Tronsue (1969), Utley (1972), West (1971)]. Although English ACT did not show up as a significant variable in the ANOVA studies for the first semester, and only in one case (Brief Forms) in the second semester, its high importance in the Regression equations in both the first and second semesters indicates that it should always be considered [National Secretaries Association (International), 1973].

The ANOVA Table for the Measure: Brief Forms is shown in Table II:

TABLE II

ANOVA: MEASURE = Brief Forms Test Average

SOURCE OF VARIANCE	DF	MEAN SQUARES	F-Ratio	Significance Level
ACT English (High, Low)	1	850.31	6.94	$p < .01$
GROUPS (Cent., Gr-A, Gr-B)	2	570.24	4.65	$p < .05$
INTERACTION (ACT x Groups)	2	377.44	3.08	n.s.
WITHIN CELL	30	122.58		

Other ANOVA tables are similar, with the group effect being always significant and no others significant. The group effect always favors the Gregg B group over Gregg A over Century 21. The performance of the Gregg B group on Dictation and Theory is the highest (usually at the .01 level) with the Gregg B performance on Brief Forms usually exceeding the others (especially Century) at the .05 level of significance.

These results differ somewhat from those found in the first semester, where the Gregg and Century groups were found not to differ significantly on any performance measure, while the effects of high and low ACT scores were significant only for Math and Overall ACT when Dictation and Final Average were the measures of performance.

It should be noted that the differences between Century 21 and Gregg A students in the current semester were seldom significant. Most of the differences were between the Century 21 students and Gregg B students, who always excelled. The Gregg A and Gregg B students were very similar in their performances in the Dictation measure, both exceeding the Century 21 group significantly. In all other measures only the Gregg B students excelled Century 21 students.

Why compare Gregg B students with Century since they are a late-coming group with more experience in shorthand? Simply because without them the total sample size in the experiment would be too small (N = 24) to detect any but the grossest differences between groups. With the Gregg B group present in the sample we can be assured that the observed differences between Gregg A, Gregg B and Century are indeed detectable and occasionally significant. The lack of significance between language groups and ACT groups can also be demonstrated more assuredly with the larger total (N = 36).

T-Test COMPARISONS

Another method of comparing group performances is through a t-test. The sample size for these comparisons is less than for the ANOVA comparisons, but they reveal some interesting similarities (and differences) between the groups. Tables III and IV show mean measures of the groups on the various background, attitude and performance measures collected.

TABLE III

t-test of Background Variables

VARIABLE	Century Students (N=14)		Gregg A Students (N=10)		Gregg B Students (N=12)		t-value		Signif. Level	
	Mean	S.D.	Mean	S.D.	Mean	S.D.	Cent. -Gr.A	Cent. -Gr.B	A	B
1. Hometown pop.	2.86	1.70	2.00	1.15	2.17	1.40	1.38	1.12		
2. Family Income	1.93	1.98	1.20	1.69	1.92	2.15	0.94	0.01		
3. Father's Educ.	3.64	2.59	4.00	1.83	3.75	2.05	-0.37	-0.12		
4. Mother's Educ.	3.93	2.62	3.60	0.84	3.58	2.07	0.38	0.37		
5. H.S. GPA (Scale)	4.29	0.61	4.00	0.67	4.08	0.79	1.09	0.77		
6. Foreign Lang. Use	0.29	0.47	0.40	0.52	0.25	0.45	-0.56	0.20		
7. ACT English	18.29	0.61	13.30	0.60	17.58	0.49	1.99	0.32	.10	
8. ACT Math	14.79	1.12	7.90	0.63	12.08	0.38	1.75	0.80	.10	
9. ACT Soc. Studies	15.57	0.63	10.60	0.60	13.33	0.42	1.94	1.05	.10	
10. ACT Science	18.71	0.66	15.60	0.58	16.33	1.83	1.20	1.12		
11. ACT Overall	16.93	0.68	11.90	0.49	14.92	2.39	1.99	0.97	.10	
12. Hrs. Studied/ Wk.	8.79	2.86	8.90	1.73	7.50	1.78	-0.11	1.35		
13. Recent English	0.64	0.50	0.30	0.48	0.67	0.49	1.68	-0.12		
14. Coll. GPA (Avg.)	2.67	0.62	2.29	0.20	2.22	0.46	1.87	2.06	.10	.05
15. Ethnicity	1.79	0.97	1.50	0.53	1.42	0.90	0.84	1.00		

- = favors Gregg Students

TABLE IV

t-test of

Attitude and Performance Variables

VARIABLE	Century Students (N=14) Mean	S.D.	Gregg A Students (N=10) Mean	S.D.	Gregg B Students (N=12) Mean	S.D.	t-value Cent. -Gr.A	Cent. -Gr.B	Signif. Level A	B
CAREER OUTLOOK SUB-SCORES (Nat'l Mean = 50)										
16. Self-dev.	49.50	7.25	46.60	14.58	49.00	7.25	0.64	0.14		
17. Utilitarian	46.36	9.84	44.00	14.61	45.42	9.84	0.47	0.29		
18. Preparator	52.21	8.68	52.50	6.29	50.83	8.68	-0.09	0.37		
19. Procrastinator	48.29	7.64	47.90	7.59	44.92	7.64	0.12	0.92		
20. Interactive	48.00	9.07	50.10	8.32	48.92	9.07	-0.58	-0.30		
21. Planner	45.14	8.79	46.90	10.69	46.17	8.79	-0.44	-0.31		
22. Risk-taker	51.86	8.44	50.00	8.39	49.00	8.44	0.53	0.84		
23. Socializer	49.43	10.87	51.50	6.60	46.17	10.87	-0.53	0.95		
24. Temporalist	48.29	10.67	52.60	13.48	51.00	10.67	-0.88	-0.75		
25. Rationalist	49.36	5.98	52.10	6.71	52.67	5.98	-1.05	-1.45		
26. Advancer	53.86	6.64	53.40	8.46	52.25	6.64	0.15	0.73		
27. Socially Aware	46.43	9.54	48.90	8.50	44.08	9.54	-0.65	0.75		
28. Indepen.	46.64	9.36	45.80	8.63	47.00	9.36	0.22	-0.10		
29. Region.	47.50	8.41	50.60	10.48	48.33	8.41	-0.80	-0.27		

(Table IV - Items 30 - 33 on following page)

TABLE IV (continued)

t-test of

Attitude and Performance Variables

VARIABLE	Century Students (N=14) Mean	S.D.	Gregg A Students (N=10) Mean	S.D.	Gregg B Students (N=12) Mean	S.D.	t-value Cent. -Gr.A	Cent. -Gr.B	Signif. Level A	B
SHORTHAND PERFORMANCE										
30. Dictation	69.64	? 97	75.56	0.34	97.49	2.97	-2.08	-3.24	-.05*	-.01*
31. Theory Tests	63.92	2.82	80.77	2.31	92.38	2.83	-1.55	-3.42		-.01*
32. Brief Forms	70.79	1.37	75.50	1.33	84.00	1.37	-0.84	-2.84		-.01*
33. Final Avg.	66.64	2.34	79.50	1.45	87.12	2.34	-1.54	-2.95		-.01*

- = favors Gregg Students

*These significant differences may be fortuitous because of the carrying of borderline students in Century (as well as in Gregg A) who lower the average performance. These borderline students do not perform satisfactorily and pull the average down considerably. See text.

Table III indicates that the three groups of students (Century, Gregg A, and Gregg B) are very similar to each other in background and preparation. In fact, the Century students exceed both Gregg groups on most measures, and those where they don't, the difference is miniscule. However, on only one measure is there a significant difference: ($p < .05$) in College GPA, where the Century group exceeds the Gregg B group. The Century group exceeds the Gregg A group at near-significance ($p < .10$) levels for four out of five of the ACT measures (the Science score differences do not approach significance).

Turning to Table IV, we find that there are no significant or near significant differences on the Attitude measures (the 14 CEDQ sub-test scores). There may be some differences between the groups, however, in that both Gregg groups differ from the Century group in many of the same CEDQ variables. This pattern will be discussed in a later section.

An examination of the Shorthand performance measures reveals that the Gregg B group always exceeds the Century group at a significant level, while the Gregg A group exceeds the Century group significantly only in Dictation. This is a repeat of the same findings utilizing the ANOVA approach.

*This data seems to say that Gregg B students significantly outperform Century students, and Gregg A students sometimes significantly outperform Century students. However, the Shorthand performance measures are influenced somewhat by the fact that more marginal students are being carried in Century than in Gregg. This effect can be checked against the Dictation performance measures. When the four marginal (plus one dropout) Century students and the two marginal Gregg A students are dropped and the mean performance recomputed, the means for Century and Gregg A become 83.01 and 84.74 instead of 69.64 and 75.56, respectively. The new results are clearly not significant. The other three mean performances for Century become: 81.7, 87.8 and 83.0 for Theory, Brief Forms, and Final Average, respectively, as opposed to 91.3, 97.6, and 84.7 for Gregg. Clearly, none of the differences between Century and Gregg A or B are significant and one (Brief Forms) now exceeds Gregg B. The results of the ANOVA analysis and of the t-tests in Table IV must not be taken too literally. In all other measures these three groups are very similar. The performance measures may well be suspect. Whether we are justified in dropping failing students and comparing only successful ones is a sticky point. Nevertheless, if we do that, the performance measure differences disappear.

DIFFERENCES BETWEEN GROUPS ON CAREER OUTLOOK (CEDQ) SCALES

If we look at the mean ratings of the three groups on Variables 16-29 of Table IV, the CEDQ sub-scales of the Career Education Development Questionnaire developed at New Mexico State University to aid high risk college students in self-development, we find some patterns developing. The Century students greatly exceed one (or both) of the Gregg groups in the following sub-scales:

Self-developer	)	
Utilitarian	)	
Preparator	)	
Procrastinator	)	
Risk-taker	)	Entrepreneur
Socializer	)	
Advancer	)	
Socially Aware	)	
Independent	)	

Gregg groups exceed the Century group in the following sub-scales:

Interactive	)	
Planner	)	
Temporalist	)	Conservative
Rationalist	)	
Regionalist	)	

These two groupings could be indicative of a psychological type. It is interesting to note that both Gregg groups (the high scoring Group B, as well as Group A) both tend toward the same type--Conservative. These results are not totally consistent and the group measures do not differ statistically, but there is some indication of the usefulness of the CEDQ.

Previous research on using psychological, aptitude or attitude tests to predict successful students in shorthand have met with mixed success. Balsley (1975) cites some work with Wechsler scales where dictation ability is related to subtests of the WAIS. Other studies have given good marks to the Turse Aptitude Test [Curley (1971), Gallion (1971), Lambrecht (1972), and O'Connell (1968)], while Byers and Allyn's or the ERC stenographic tests also are useful [Gallion (1971), Handorf (1973, Lambrecht (1972), and Lambrecht (1971)]. Others have devised special aptitude tests that have some validity [De Dea (1967), Durso (1973), Holderness (1976), Ranson (1972), Skaff (1973)]. In general the findings have been that no one aptitude test does the job adequately, but that the aptitude tests in combination with background variables and some attitude measures can be useful in selecting students with a high probability of success.

Studies of psychological batteries, either standardized or administered individually, have had mixed success [Balsley (1975), Durso (1973), Ellington (1972), Moskovis (1969), Reid (1974), Rittenhouse (1968), West (1971)].

Similar results are reported here. The CEDQ is useful in predicting shorthand success, but only in conjunction with other background variables and ACT scores. It is interesting to note that some of the CEDQ sub-scales are better predictors (more important to the regression equation) than is ACT (see the last section: Regression Equations).

The mean scores for the CEDQ measures in Table IV are based on an experimental sample mean of some 250 students, marginal and otherwise. A score above 50 indicates more of that tendency; a score below 50 indicates less of that tendency than the sample group.

FACTOR ANALYSIS

A factor analysis of the 43 variables collected by various forms in this study revealed two types of clustering for the two types of students (Century and Gregg). When a 3-factor solution was extracted from the variables involved, 76 to 86 percent of the total variance was explained by the factor structure. The two strongest factors for the Century students contained CEDQ subtests in much the same configuration as the conservative cluster just described, while the factor structure for the two Gregg groups included the Entrepreneur clustering of CEDQs. This result is different from the observations that led us to infer that the Century group tended toward a Conservative type and the Gregg group tended toward an Entrapreneur type. However, many of the factor weightings are negative for the CEDQ items.

For the Century group, the Gregg performance measurer clustered with the two strong factors with Conservative CEDQ measures, while for the two Gregg groups the Gregg performance measure clustered with the third (weaker) factor related to the parts of the Entrepreneural grouping of CEDQ scores. The biographical data for both Century and Gregg students clustered around Factors I, II and III in such a manner that Factor I could be called: Background and Current Achievement; Factor II: Family; Factor III: Previous Achievement. ACT scores tend to collect with the third factor, Previous Achievement. Final scores in Shorthand Achievement tend to relate to Factor I, while the other Shorthand Achievement scores generally relate to Factor III (for Gregg students) and Factor II for Century students.

If the three groups of students are different (Gregg students are Conservative; Century students are Entrepreneural) as noted from their scoring patterns on the CEDQ, then success in shorthand for Century students accompanied high scores in the Entrepreneur CEDQ scales, while shorthand success for Gregg students accompanied higher scores in the Conservative CEDQ scales. Because of the shift in signs of some of the factors for the CEDQ items and the shorthand measures, the factor structure does support the concept of Century students as Enterpreneural--risk takers and Gregg students as Conservatives.

REGRESSION EQUATIONS FOR PREDICTING PERFORMANCE ON THE FOUR SHORTHAND MEASURES AS A FUNCTION OF BACKGROUND AND CEDQ ATTITUDE MEASURES

Regression equations for predicting success on the various shorthand measures were developed utilizing the biographical data collected with the CEDQ, Background Information and Study Habits Information (see the Appendices for these questionnaires). In addition, the performance measures of students on the ACT were gathered, along with current college Grade Point Averages. These variables, some 50 measures in all, were candidates for inclusion in a regression equation. Since the three shorthand groups only included 36 students, some set of variables numbering much less than 50 had to be chosen.

Utilizing the results of the regression equations (predicting shorthand performance) from the first semester of the study (Heins, et al., 1976), 29 variables were chosen for regression prediction and the first 15 variables entering the regression equation would be considered as predictors. The 28 variables are listed in Table V.

TABLE V

Variables To Be Considered As Independent

Variables in Regression Equations

Predicting Shorthand Performance

1.	Age	
2.	"Hometown" Population	
3.	Father's Education	
4.	Mother's Education	
5.	H.S. GPA (Coded)	
	14 CEDQ SUBTESTS:	
6.	Self-Developer	
7.	Utilitarian	
8.	Preparator	
9.	Procrastinator	
10.	Interactive	
11.	Planner	
12.	Risk-taker	From the CEDQ
13.	Socializer	
14.	Temporalist	Questionnaire
15.	Rationalist	
16.	Advancer	
17.	Socially Aware	
18.	Independent	
19.	Regionalist	
20.	English-ACT	
21.	Math-ACT	
22.	Social Studies-ACT	From Student Records
23.	Science-ACT	
24.	Overall-ACT	
25.	Foreign Language Spoken at Home	From Background and
26.	Hours/Week Outside Study	Study Habits
27.	Have Taken A College English Course Recently?	Questionnaire
28.	College GPA	

The results of constructing multiple regression equations are shown in the following tables (VI - IX). The variables are listed in order of their entry into the final regression equation, the multiple R being calculated after each entry, as well as the R^2 (a measure of the proportion of variance in the dependent variable--Shorthand Performance--accounted for). In addition, the increase in R^2 as each variable enters is given.

The last entry in the table indicates the weighting of the individual raw scores in predicting the shorthand performance. A negative sign indicates that the variable is negatively weighted (an inhibitor) in the final equation. Each of the variables listed (and others not listed) entered the equation at a significant level, that is, the contribution to the total variance was significant at the $p < .01$ level or better. However, from a practical point of view, only some variables contributed to the explanation of the total variance in a useful or important way. As a rule of thumb, the "important" variables "explained" (increased in R^2) at least two percent of the overall variance. These are noted in the tables by an oval around the increase in R^2 entry.

TABLE IV

Regression Summary Table

Dictation

STEP NO.		VARIABLE ENTERED	MULTIPLE R	MULTIPLE R^2	Increase In R^2	REGR. COEFF.
						CONSTANT = 18.487
1	15	Rationalist-CEDQ	.33	.1098	(.1098)	2.177
2	27	Hours Studied	.52	.2677	(.0453)	4.489
3	11	Planner-CEDQ	.57	.3196	(.0519)	0.774
4	20	English-ACT	.66	.4345	(.0250)	6.615
5	28	English Recently	.68	.4674	(.0329)	-16.805
6	22	Soc.Stud.-ACT	.72	.5160	(.0486)	1.375
7	9	Procrastinator-CEDQ	.74	.5476	(.0316)	- 2.398
8	8	Preparator-CEDQ	.78	.6074	(.0598)	- 1.567
9	2	"Hometown" Pop.	.79	.6273	.0199	- 7.409
10	10	Interactive-CEDQ	.80	.6402	.0129	- 1.002
11	24	Overall-ACT	.82	.6766	(.0364)	- 7.693
12	16	Advancer-CEDQ	.83	.6925	.0159	1.291
13	19	Regionalist-CEDQ	.84	.7095	.0171	0.575
14	5	H.S. GPA	.85	.7206	.0110	- 7.994
15	3	Father's Education	.86	.7344	.0139	4.387

( ) = Most Important Contributors

TABLE VII

Regression Summary Table

Theory

STEP NO.		VARIABLE ENTERED	MULTIPLE R	MULTIPLE R^2	Increase In R^2	REGR. COEFF.
					CONSTANT	= 190.131
1	1	Age	.33	.1111	(.1111)	3.286
2	9	Procrastinator-CEDQ	.45	.2003	(.0892)	- 2.543
3	8	Preparator-CEDQ	.59	.3524	(.1520)	- 2.790
4	23	Science-ACT	.67	.4549	(.1026)	- 7.674
5	20	English-ACT	.73	.5326	(.0777)	4.633
6	4	Mother's Education	.78	.6094	(.0768)	- 2.884
7	29	College GPA	.80	.6419	(.0325)	6.064
8	18	Independent-CEDQ	.83	.6806	(.0387)	0.523
9	10	Interactive-CEDQ	.84	.7101	(.0295)	- 0.888
10	11	Planner-CEDQ	.86	.7384	(.0283)	0.939
11	28	English Recently	.88	.7815	(.0431)	-23.975
12	26	For. Lang. Spoken	.90	.8079	(.0264)	-12.698
13	19	Regionalist-CEDQ	.91	.8280	.0100	- 0.346
14	27	Hours Studied	.92	.8377	.0097	1.263
15	2	"Hometown" Pop.	.92	.8473	.0096	- 8.142

( ) = Most Important Contributors

TABLE VIII

Regression Summary Table

Brief Forms

STEP NO.		VARIABLE ENTERED	MULTIPLE R	MULTIPLE R^2	Increase In R^2	REGR. COEFF.
					CONSTANT	= 90.030
1	8	Preparator-CEDQ	.33	.1067	.1067	- 0.710
2	11	Planner-CEDQ	.55	.3037	.1970	0.856
3	5	H.S. GPA	.62	.3806	.0768	3.565
4	13	Socializer-CEDQ	.68	.4580	.0244	- 0.792
5	26	For. Lang. Spoken	.71	.5085	.0505	- 8.014
6	6	Self-Developer-CEDQ	.73	.5341	.0256	0.429
7	10	Interactive-CEDQ	.74	.5525	.0184	- 0.452
8	27	Hours Studied	.75	.5694	.0169	3.673
9	1	Age	.77	.5926	.0232	- 3.247
10	9	Procrastinator-CEDQ	.80	.6424	.0206	- 0.358
11	20	English-ACT	.81	.6527	.0103	3.058
12	28	English Recently	.84	.7087	.0329	-11.651
13	15	Rationalist-CEDQ	.86	.7378	.0291	- 0.792
14	24	Overall-ACT	.88	.7689	.0311	- 2.805
15	2	"Hometown" Pop.	.89	.7837	.0148	- 0.270

(.....) = Most Important Contributors

TABLE IX

Regression Summary Table

Overall Average

STEP NO.		VARIABLE ENTERED	MULTIPLE R	MULTIPLE R^2	Increase In R^2	REGR. COEFF.
					CONSTANT =	103.091
1	4	Mother's Education	.30	.0925	(.0925)	- 1.732
2	11	Planner-CEDQ	.38	.1466	(.0542)	1.100
3	8	Preparator-CEDQ	.50	.2482	(.1016)	- 1.597
4	18	Independent-CEDQ	.56	.3123	(.0641)	- 0.936
5	9	Procrastinator-CEDQ	.63	.3938	(.0815)	- 1.462
6	23	Science-ACT	.69	.4764	(.0826)	- 1.820
7	10	Interactive-CEDQ	.73	.5398	(.0633)	- 0.852
8	26	For. Lang. Spoken	.78	.6042	(.0645)	-12.896
9	16	Advancer-CEDQ	.80	.6374	(.0331)	0.826
10	20	English-ACT	.82	.6646	(.0273)	4.946
11	28	English Recently	.82	.6792	.0145	-16.28
12	27	Hours Studied	.84	.7065	(.0273)	3.454
13	22	Soc. Stud.-ACT	.85	.7242	.0177	1.415
14	15	Rationalist-CEDQ	.87	.7534	(.0292)	1.222
15	6	Self-Developer-CEDQ	.87	.7691	.0075	0.469

( ) = Most Important Contributors

The final regression equations, utilizing 15 independent variables explained 76 to 85 percent of the variance in the shorthand performance measures. These percentages are probably inflated due to the small sample considered (N=36). However, a relatively good explanatory power is demonstrated.

Examining the Regression Summary Tables shows that the CEDQ subtest scores are consistently among the most important (and highest) contributors, while English ACT is usually (but not always) a very important contributor. "Taken An English Course Recently" is also of some importance, often accompanying the English ACT score in order of entering the regression equations.

The vairable "Foreign Language Spoken at Home" enters the regression equations for Theory, Brief Forms, and Overall Average as one of the most important negative contributors. In the first semester (Heins, et al., 1976) this variable entered each of the regression equations as a positive contributor. This may be indicative of the relative importance that transcription has in the second semester efforts, where incorrect spellings and wrong word choice take their toll of students not well prepared in English. Previous research has shown that aptitude for and study of a foreign language is a positive predictor of shorthand success [Curley (1974), Ellington (1973), Gallion (1971), and Lambrecht (1972)]. However, the variable "Foreign Language" in this study is the native language of the students who may not have perfected their knowledge of English because of the pervasive influence of a foreign language at home. The students may not have "studied" the foreign language.

Mathematics ACT is not an important predictor in the present set of regression equations, while it was of moderate importance previously.

"Hours studied" is a very important contributor to predicting Dictation scores, but is of lesser importance for other measures. High School or college Grade Point Averages (but not both) are useful predictors, but do not always enter as a most important predictor. "Mother's education" sometimes enters the equation as a negative (inhibitor) predictor, while "Father's education" enters as a positive predictor. "Mother's education" is usually a more important variable. "Hometown population" enters most of the equations as a negative, indicating that students from smaller towns do better than those from larger ones.

The contribution of the CEDQ scales is interesting. A larger proportion of the CEDQ subtests come from the sub-category Conservative as detailed above. Three or four of the five sub-scales enter each of the regression equations, often as either first or second in importance in the regression equation. On the other hand, from three to five of the Entrepreneur sub-scales enter each of the regression equations. The proportional representation of the Entrepreneural subtests is less than for the Conservative subtests. Most of the Entrepreneural CEDQ scales enter as negative contributors (9 or 15 cases), while most of the Conservative CEDQ scales enter as positive (8 out of 13 cases). In any case, the CEDQ subtests are more useful as predictors of success than the traditional ACT,

CPA and family background variables. The students' attitudes about study and careers in general just may be the best predictors in a difficult course of study such as shorthand mastery.

BIBLIOGRAPHY ON SHORTHAND PROGNOSIS

Eldon Johnson, Doctoral Candidate, NMSU

Balsley, Irol W. "Basic Conditions of Effective Shorthand Learning," The Balance Sheet, 65:244-248, March 1975.

No definitive tests are available as yet to measure readiness in shorthand. Data has revealed:

1) Shorthand skill development involves both verbal and performance skills and subskills. The brain functionings involved in these subskills and their intercorrelation is yet to be determined.

2) Note taking and transcribing subskills differ, requiring different criterion measures.

3) A battery of tests is required for prediction.

4) Different shorthand systems require different mental capabilities. Particular predictive measures would likely pertain to one system only.

Halcomb, Anderson and Balsley (1974) utilized the scores on subsections of the Wechsler Adult Intelligence Scale and the Halcomb Psychomoter Battery. A high correlation was found between taking dictation ability and high performance on the Information, Picture Completion, Arithmetic, and Object Assembly subtests on the WAIS.

Curley, Delores B. "The Influence of Attitudes on Results in Shorthand Classes," Business Education Forum, 28:36-38, January 1974.

This article cites a study by Gallion (1971) which concludes that the Turse aptitude test is the best devised predictor of shorthand success. Other good predictors include English and foreign language grades, and other mental ability tests, although no single test, characteristic, or trait is adequate alone.

De Dea, Eileen. "A Study of the Effectiveness of Prognostic Tests and Measures in Predicting Shorthand Achievement," Master's thesis, University of New Mexico, Albuquerque, 1957.

Standard aptitude tests such as the Turse, ERC, Bennett, and DAT were found more related to general abilities than to shorthand competency. Leslie's interest inventory and a phonetic spelling test correlated well with Theory and Brief forms achievement, while spelling tests correlated with transcription skills.

Durso, Mary W. "The Relationship of Receptive and Expressive Functions to Performance in Beginning Collegiate Shorthand," Ph.D. dissertation, Georgia

State University, Atlanta, 1973. Business Education Forum, 29:33, October 1974.

The purpose of this study was to examine the relationship of students' ability to decode, process, and encode auditory and visual stimuli to dictation achievement in beginning collegiate shorthand. Stimuli perception was measured by a series of ten tests, achievement scores by a series of three-minute dictation takes. The factor having the highest correlation with criterion of achievement was the student score on the phonetics test of the auditory-visual battery. Students who had shorthand previously scored significantly higher on this battery than non-shorthand students. Students with lower IQ scores and more errors on the audio-visual tests also scored lower on the achievement criterion. There was marked significance in predicting dictation success by audio-visual stimuli.

Ellington, Allen R. "The Cloze Procedure and Selected Measures as a Means of Predicting Success in First-Year Shorthand," Ed.D. dissertation, The University of Georgia, Athens, 1972. Business Education Forum, 28:40, October 1973.

The Cloze procedure was tested for effectiveness in determining the extent of intelligence scores, modern language aptitude scores, language achievement scores, and grade point averages as single and multiple predictors of shorthand success at the secondary level. The highest single predictors were intelligence scores and Modern Language Aptitude Test scores, which were as strong predictors as all five variables combined.

Gallion, Leona M. "The Teaching of Shorthand and Transcription," The National Business Education Yearbook, No. 9. Washington: National Business Education Association, 1971, pp. 38-39.

In a review of shorthand research to date, the Turse Aptitude Test was found to be more effective than the Byers or Allyn tests. Foreign language aptitude was found to be a strong predictor of dictation and transcription success but not sufficient as a single predictor. The best predictors for first-semester shorthand are grade point average, 9th and 10th grade English grades, and mental ability. A number of measures were suggested, including critical thinking, study habits and attitudes, and clerical speed and comprehension when advising college-level students into beginning shorthand. The writer concludes that a combination of selection factors rather than a single measure is essential for predicting achievement in shorthand.

Handorf, James L. and Holderness, Aubrey E. "Development of a Formula for Predicting Success in First-Year and Second-Year Shorthand," Ph.D. dissertation, University of Northern Colorado, Greeley, 1972. Business Education Forum, 28:42-43, October 1973.

The study attempted to develop predictors of shorthand and transcription success from examining 27 variables. Through regression analysis, the following predictor variables were found to be the strongest for first-year shorthand success: 1) Part 3, Phonetic Spelling of the ERC Stenographic Aptitude Test, 2) the Symbol Writing and Transcription section of the Bennett Stenographic Aptitude Test, 3) the Paired Associates section of the Modern Language Aptitude Test, 4) overall grade point average. Second-year

predictors: 1) Part 1, Speed of Writing of the ERC test, 2) Part 3, Phonetic Spelling of the ERC test, 3) the Symbol Writing and Transcription section of the Bennett Stenographic Aptitude Test, 4) overall grade point average, 5) previous shorthand achievement.

Heins, Eleanor A., Eileen De Dea, Theodore G. Brough, Sandra Strange and Gayle Brown, An Evaluation of the Project: Pilot Course in Century 21 Shorthand, New Mexico State University, Dona Ana County Occupational Education Branch, Las Cruces, February 1976.

Gregg and Century 21 are about equally successful in preparing students. Century 21 has a greater holding power for students who speak a foreign language at home (Spanish).

Holderness, Aubrey, and James Handorf "Predicting Success in First-Year Shorthand," Business Education Forum, 30:11-12, April 1976.

Through testing and multiple regression, 22 shorthand learning factors were isolated and developed into three equations for predicting shorthand success. Four measures were found to be successful in predicting shorthand theory performance and reading ability at the end of one semester and dictation-transcription ability at the end of one year: 1) word recognition from phonetic spelling, 2) symbol writing, 3) nonsense syllable recall, 4) overall grade point average. By administering tests of these measures to random samples of 30 beginning students, high correlations were found between scores and criterion measures given after periods of instruction.

Kinsey, Don R. "Predicting Success in Shorthand," School and Community, 57:23,80, November 1970.

In a comparison of shorthand grades received by students who had taken shorthand with grades received on subtests of the Differential Aptitude Test, accumulative grade point average and the sentence subtest had the highest relationship with shorthand grades.

Lambrecht, Judith J. "Aptitude Testing in Shorthand," Business Education Forum, 27:17-24, October 1972.

This article is drawn from a doctoral study by the author, and includes a review of previous research in the shorthand prognosis area. Over 200 studies since 1912 have dealt with aptitude for shorthand, primarily due to the concern over high attrition rates, and for developing differentiated instruction. A combination of measures is preferred over only one factor, although verbal measures such as English grades, and particularly foreign language grades or aptitudes seem to be the best predictors. Previous grade point averages correlate with shorthand grades but less well with more precise measures. IQ is not a reliable predictor in itself although it may suggest other measures be taken. English skills are more closely related to transcription than to shorthand skills. Vocabulary measures seem to be related to both writing and transcribing shorthand. The Turse Shorthand Aptitude Test (1940) and ERC Stenographic Aptitude Test (1947) are cited

as having value in predicting transcription ability. Segments of these tests seem to be as reliable as the complete batteries. Particular problems in predictive research in shorthand are discussed. A revision of the 1959 Byers' First-Year Shorthand Aptitude Tests is described. The revised test includes three subtests: 1) Disarranged Syllables, 2) Observation Aptitude, and 3) Phonetic Perception. It is found to be particularly effective at the high school level. Aptitude tests may also be useful in individualizing instruction.

Lambrecht, Judith J. "The Validation of a Revised Edition of the Byers' Shorthand Aptitude Test," Ph.D. dissertation, The University of Wisconsin, Madison, 1971. Business Education Forum, 27:42-43, October 1972.

The study revised and revalidated the Byers' First-Year Shorthand Aptitude Tests, developed by Edward E. Byers in 1959.

Moskovis, L. Michael "Shorthand Prognosis: Some Conclusions and Recommendations," The Balance Sheet, 50:252-254, 287, February 1969.

Most researchers agree that various published shorthand and foreign language aptitude tests and measures of general ability are not reliable predictors of success in shorthand. Cumulative grade point average shows the same relationship to other subjects as it does to shorthand, and intelligence scores do not have a high enough relationship to be used alone. Several useful predictors, if used together, include general mental ability, English composition grades, overall grade point average, and personal trait ratings. A doctoral study by the author in 1967 led to several conclusions: Standardized English composition and spelling pretests can identify students with weaknesses which are related to shorthand skill, vocabulary skill is important, and a standardized study habits and attitudes scale can help identify successful shorthand students.

National Secretaries Association (International), "Ten Criteria for the Selection of Stenographic Students," National Secretaries Association (International), Kansas City, Missouri, 1973.

A nationwide survey of secretaries, management, and business education teachers resulted in a rank-ordered list of important criteria for selecting high school stenographic students. The most important was aptitude as measured by clerical and business aptitude tests such as the Minnesota Clerical Test. Other criteria of high importance were: Interest, Ambition, Responsibility, and Skill in reading, writing, arithmetic, and typing. The least important of the ten in the list were school attendance and high school grade point average.

O'Connell, Mary M. and Russel J. Hosler "Predictors of Success in Shorthand," Journal of Business Education, 44:96-98, December 1968.

In a study of 210 high school students enrolled in beginning shorthand, the two factors that correlated the highest with shorthand achievement were overall high school grade point average and scores on the Turse Aptitude Test.

Neither criterion should be used separately in predicting shorthand success; as many factors as possible should be used.

Ranson, James T. and Edgar R. Smith "Symbol Recognition and Shorthand Success," Business Education Forum, 27:28-30, October 1972.

After preliminary instruction, a test of recognizing the basic 25 shorthand characteristics given to potential shorthand students was found to have significant predictive validity for learning shorthand.

Reid, Jayne "Contemporary Research in Shorthand and Its Significance in the Classroom," The National Business Education Yearbook, No. 12. Reston, Va.: National Business Education Association, 1974, pp. 213-221.

Studies from 1954 to 1967 indicate that the variables most highly correlated with shorthand success are specific purpose aptitude tests, grade point average, achievement test data in reading, spelling, or English grammar, and IQ. More recent studies indicate that personality traits and attitudes bear a relationship to success in beginning shorthand but not for later shorthand and transcription courses.

Rittenhouse, Evelyn J. "A Study of Certain Factors Influencing Success in the Learning and Achievement of Shorthand," Ph.D. thesis, Michigan State University, 1968. Journal of Business Education, 45:30 October, 1969.

This study was concerned with two methods of shorthand teaching, and isolating psychological factors within the learner which may affect shorthand achievement by using selected psychological tests. No value could be found in the tests either singly or as a battery, and no factors determining shorthand success could be isolated.

Skaff, Lorrine B. "The Development and Validation of Predictive Instrument to Measure Student Success in the First Semester of Gregg Shorthand," Ed.D. dissertation, Oregon State University, Corvallis, 1972. "Development of a Shorthand Aptitude Test," Business Education Forum, 27:26-28, October 1972. Business Education Forum, 28:54-55, October 1973.

A predictive instrument was developed and evaluated for first-semester shorthand success. Out of the five parts, phonetic understanding and spelling, and proofreading and punctuation showed the greatest relationships to the first-semester shorthand grade.

Tronsue, Mary E. "A Study of Relationships of Selected Variables with Shorthand Transcription Speed," Ed.D. dissertation, University of Maryland, 1969.

A subsidiary problem investigated within this study was to determine interrelationships of transcription speed and 1) straight-copy typewriting speed, 2 & 3) scores on the Iowa Tests of Educational Development tests on Correctness and Appropriateness of Expression, and General Vocabulary. Relevant

findings from analysis of variance and regression analysis determined a positive relationship between transcription speed and the three variables, and that straight copy typewriting speed and score on the expression test work more effectively as predictors in conjunction than in isolation.

Utley, Kenneth W. "The Effect of Background Factors on Achievement in Two-Year Shorthand at Selected Universities," Ph.D. study, Ohio State University, 1971. Journal of Business Education, 47:296, April 1972. Business Education Forum, 26:55, October 1971.

The purpose of this study was to determine what effect selected background factors have on students' achievement in second-year shorthand, in order to prepare recommendations for counseling purposes. Complete data were secured for 150 students enrolled in second-year shorthand at eight universities from the students, transcription of a dictation test, and student records. Criterion of achievement was the final grade. 92% of the grades were correctly predicted within one letter grade. Conclusions: Use of a dictation test, ACT English and Composit test scores, and grade-predictor formula are useful predictors. Office experience factor was a limited predictor.

West, Leonard J. Research on Teaching Business and Commercial Subjects, New York: City University of New York, New York Division of Teacher Education, January 1971. ERIC: ED 051 377.

In a review of related research, the writer notes Freiberg's (1968) finding that IQ above 110 was a strong predictor of success in shorthand training. In other research, grade point averages and English course grades are found to be pertinent predictors.

OTHER ARTICLES NOT CITED

Cullinane, Donna "A Comparative Analysis Among Theory Achievers in First-term College Shorthand," M.S. thesis, University of Wisconsin, 1973.

Cwierz, Helen A. "The Relationship of the Turse Shorthand Aptitude Test, I.Q., and English Grades to Success in Beginning Shorthand," M.Ed. thesis, Indiana University of Pennsylvania, 1968.

Forkner, Hamden L. "Research and the Future of Shorthand Systems," Kansas Business Teacher, 23:3-5, December 1969.

Freiberg, Foster "A Study to Determine the Validity of Administering a Stenographic Aptitude Test at Medford High School," M.S.T. thesis, Wisconsin State University at Eau Claire, 1968.

Grant, Carmella B. "The Relationship of Certain Test Batteries and Course Grades to Success in Shorthand," M.S. thesis, University of Maryland, 1971.

Halcomb, Charles, Robert Anderson, and Irol Balsley "A Psychological Battery Approach to the Assessment and Evaluation of Shorthand Skills," Texas Tech University, 1974.

Moskovis, L. Michael "An Identification of Certain Similarities and Differences Between Successful and Unsuccessful College Level Beginning Shorthand Students and Transcription Students," Doctor's thesis, Michigan State University, 1967.

Moskovis, L. Michael "Similarities and Differences of College-level Successful and Unsuccessful Shorthand Students," Delta Pi Epsilon Journal, 12:12-16, February 1970.

Nanassy, Louis "Current Research in Shorthand/Transcription," Century 21 Reporter, Fall 1974.

Shapiro, Sandra R. "The Prediction of Success in Shorthand I Based on the Academic Promise Test, Nelson-Denny Reading Test, and English I Grades at Lincoln High School, Jersey City, New Jersey," M.A. project, Montclair State College, 1972.

APPENDICES

Research Design Proposal

Questionnaires

A Proposal for Statistical Evaluation of the Project:

Pilot Courses in Century 21 Shorthand

in the

DACOEB Secretarial Administration Program

Project Proposal # NMSU-76-00004

Eleanor A. Heins, Project Director

August 28, 1975

Submitted by

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Consultant

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The consultant (Theodore G. Brough) will act as project statistical consultant during the two-year period of the experimental project, performing suitable analyses and submitting statistical reports at appropriate times (at the end of each semester).

The project is expected to supply clerical assistance where necessary for the preparation of multiple copies of questionnaires and information gathering instruments. In addition, computer time is expected to be made available by the project. It is expected that the computer time necessary should not exceed $100 per semester. Appropriate questionnaires and other testing instruments (in single copies) and any resulting IBM cards will be prepared by the consultant.

Reasonable access to student records (class records and University files) will be necessary during the 2-year period. Most of the information can be gathered from questionnaires supplied by the consultant or from classroom records. A few, such as ACT test scores or previous grades, may have to come from the permanent records.

The experimental design for the analysis is outlined on the following pages. The approach is 1) A controlled variable experiment (3-way Analysis of Variance) using various measures of student performance, and 2) A post-hoc analysis using multiple regression analysis. The latter approach is an attempt to find significant contributors to student performance from a many variable prediction equation.

Experimental Design: 3-Way Analysis of Variance on each Performance Measure

For each semester for both sections, the following measures will be gathered on each student:

Dependent Variables

1. Four measures of performance on Speed Forms
2. Four measures of performance on Theory
3. Four Measures of Dictation: 50, 60, 60, 80 words/min. (Standard: 3 min. with 95% accuracy). Error count at each speed.
4. Average (Performance)

Independent Variables

ACT scores (High vs. Low)

3-way ANOVA Ethnicity (Anglos vs. Others) (About 30 students in each catagory)

Shorthand Class Enrollment (Two sections) (About 30 students in each catagory)

Post hoc Analyses
(to be done at the end of each semester)
Multiple Regression Analyses

A multiple regression analysis designed to demonstrate performance as a function of many variables will be performed.

Dependent Variables (Performance Variables)

Variables listed above

Grade Achievement

Pop Quiz average

Multiple Regression

Independent Variables (Performance as a function of these)

Outside hours spent in preparation

Career Education background questions and subscores

Type of Shorthand Class enrolled in

Age

Current Enrollment in English Class

English Grade Achieved

High School Grade Point Average

College Grade Point Average

ACT scores

Ethnicity

Other Statistics

Performance

Drop out rate as a function of: ACT, Ethnicity, Shorthand Type:
Performance Measures:
Speed, Theory, Dictation

Other comparisons using grouped statistics (t-tests) as appropriate.

PILOT COURSES IN CENTURY 21 SHORTHAND

BACKGROUND INFORMATION
QUESTIONNAIRE

Name: _____ Age: _____

Permanent Address: Sex:

Street: _____ F _____

City, State: _____ M _____

ZIP Code: _____

Telephone: _____

School Address:

Street: _____

City, State: _____

ZIP Code: _____

Telephone: _____

ACT Scores: _____

Language Spoken at Home: (Check Only One)

English Only: _____

English and Other: _____

Other Most of the time: _____

What Language does Other Refer to? Please State:

_____

Programs enrolled under:

Handicapped: _____

Disadvantaged: _____

Vocational Rehabilitation: _____

SER: _____ HELP: _____

WIN: _____ JUNTOS: _____

SETA: _____ VETERANS: _____

University Programs:

Work-Study: _____

Grants: _____

Scholarships (Give Source): _____

COPE: _____

Other (Give Name): _____

HIGH SCHOOL

Name: _____

Street Address: _____

City, State: _____

ZIP Code: _____ Date of Graduation _____

Program Followed:

College Prep. _____

Business _____

Other _____

Shorthand Completed: _____semesters.

Shorthand Speed Achieved: _____wpm for _____minutes.

Percentage of Errors: _____

Typing Completed: _____semester.

Typing Speed Achieved: _____wpm for _____minutes.

Number of Errors per minute: _____

Filing Courses Completed: _____

Machines Operated, Name: _____

_____

_____

_____

_____

Career Education Description Questionnaire

This questionnaire describes some of the topics associated with a persons' choice of a career. Each person has different experiences, attitudes and views on topics related to career education. Accordingly, there are no "right" or "wrong" answers in the questionnaire, but instead statements which simply describe a variety of topics associated with career education. Please read each statement carefully and then, using the scale printed at the top of each page, indicate your response to the item.

If you are not sure about the question, you may omit answering it, or make the best possible estimate of how you feel about it. If any of the questions are objectionable to you, simply do not answer them. However, your responses to this questionnaire will be held in confidence, and no individual information will be made available to the public.

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THANK YOU

Vocational Research Project

Education Research Center

New Mexico State University

1975

Career Education Description Questionnaire

C1-4. Name _____

C5-10. If you are in a special program at the University, please write in name of the program e.g. COPE, SSS, etc. _____

BIOGRAPHICAL INFORMATION

C11. Sex
1. Male
2. Female

C12. Age
1. 18 or younger
2. 19-21
3. 22-25
4. 26-29
5. 30 or older

C13. Marital status
1. Single
2. Engaged
3. Married, no children
4. Married, with children
5. Widowed, divorced or separated

C14. Ethnicity
1. While-American
2. Spanish-American
3. Black-American
4. Native-American
5. Other (Please Specify)

_____

C15. Education
1. Pre-college
2. Freshman
3. Sophomore
4. Junior
5. Senior
6. Graduate

C16. Population of your "home town"
1. 2,500 or less
2. 2,501 to 10,000
3. 10,001 to 50,000
4. 50,001 to 100,000
5. 100,001 to 500,000
6. 500,001 or more

C17. Years lived in present community
1. One year or less
2. 2 - 4
3. 5 - 10
4. 11 - 19
5. 20 or more years

C18. Church attendance for the past year
1. Never
2. A few times
3. Once a month
4. 2 or 3 times a month
5. Once a week
6. Weekly or more

C19. Your parents yearly family income
0. Don't know
1. $3,000 or less
2. 3,001 to 5,000
3. 5,001 to 10,000
4. 10,001 to 20,000
5. Over $20,000

C20. Your yearly income, include wife if married
0. Don't know
1. $3000 or less
2. 3,001 to 5,000
3. 5,001 to 10,000
4. 10,001 to 20,000
5. Over 20,000

C21. Father's Education
1. Less than 7 years school
2. Jr. High School graduate
3. Attended high school
4. High School graduate
5. Attended college or post high school
6. College graduate
7. Attended graduate school
8. Masters degree
9. Doctors degree

C22. Mother's Education
1. Less than 7 years school
2. Jr. High school graduate
3. Attended high school
4. High School graduate
5. Attended college or post high school
6. College graduate
7. Attended graduate school
8. Masters degree
9. Doctors degree

C23. Military Service
1. Non-veteran
2. Reserve or National Guard only
3. Veteran of active duty
4. Other (Please Specify)

_____

C24. Father's attitude toward your attending college
1. Don't know
2. Opposed to my attending
3. Mixed feelings about attdance
4. Said "it was up to me"
5. Actively urged me to attend
6. Took it for granted I would attend

C25. Mother's attitude toward your attending college
1. Don't know
2. Opposed to my attending
3. Mixed feelings about attendance
4. Said "it was up to me"
5. Actively urged me to attend
6. Took it for granted I would attend

C26. What was your approximate grade point average in high school (A = 4.00)
1. .5 or less
2. .5 - 1.4
3. 1.5 - 2.4
4. 2.5 - 3.4
5. 3.5 - 4.0

1. Strongly disagree
2. Disagree
3. Agree
4. Strongly agree

VIEW OF EDUCATION

27.	Usually, I learn more on my own than I do from the instructor	1	2	3	4
28.	I would like to take only the classes I need for graduation	1	2	3	4
29.	Many required courses have little relevance to me	1	2	3	4
30.	I like classes that teach something practical	1	2	3	4
31.	I accept the idea of "knowledge for knowledge's sake"	1	2	3	4
32.	All cultural groups have the same opportunity for an education	1	2	3	4
33.	One doesn't need a college degree to get a good job	1	2	3	4
34.	The more education one obtains the more they find out how little they know	1	2	3	4
35.	College helps one learn about the cultural values of others	1	2	3	4
36.	My parents always expected me to go to college	1	2	3	4
37.	Education helps develop one's philosophy of life	1	2	3	4
38.	Instructors provide individual assistance to students	1	2	3	4
39.	College helps one find friends with other cultural backgrounds	1	2	3	4
40.	Learned very much in high school	1	2	3	4
41.	Instructors are receptive to change	1	2	3	4
42.	A degree is only a "ticket" to a good job	1	2	3	4
43.	Jobs are open to persons from all cultural groups	1	2	3	4
44.	I have learned much in my college courses	1	2	3	4
45.	College is an excellent place to find new friends	1	2	3	4
46.	I have wanted to attend college for a long time	1	2	3	4

IV

1. Strongly Disagree
2. Disagree
3. Agree
4. Strongly agree

STUDY PRACTICES

47.	I work hard to get good grades even if I don't like a course	1	2	3	4
48.	I have a definite career selected after college	1	2	3	4
49.	I put off doing homework until the last minute	1	2	3	4
50.	I can study at least one hour without being distracted	1	2	3	4
51.	During an exam I have difficulty remembering things I know	1	2	3	4
52.	I am interested in most of my classes	1	2	3	4
53.	I worry about flunking out of college	1	2	3	4
54.	I usually study in the same place	1	2	3	4
55.	Obtain help from someone if I don't understand	1	2	3	4
56.	Use a dictionary to find the meaning of words I don't know	1	2	3	4
57.	Read assignments prior to attending class	1	2	3	4
58.	Review class materials several days before the exam	1	2	3	4
59.	Allow time for relaxation and recreation	1	2	3	4
60.	Can easily express myself orally	1	2	3	4
61.	Can easily express my thoughts in writing	1	2	3	4
62.	Try and anticipate what the instructor will ask on an exam	1	2	3	4
63.	My mind wanders when I try to study	1	2	3	4
64.	Cram the night before an exam	1	2	3	4
65.	Homework has first priority over most things	1	2	3	4
66.	Perform at my best during an examination	1	2	3	4
67.	Do my homework on a regular basis	1	2	3	4
68.	Participate actively in class discussions	1	2	3	4
69.	Go out at night with others during the school week	1	2	3	4
70.	.I need to improve my study habits	1	2	3	4

1. [illegible]
2. Disagree
3. Agree
4. Strongly agree

SELF CONCEPT

71.	It is important for me to get ahead	1	2	3	4
72.	I get along with most people	1	2	3	4
73.	I have accomplished many difficult things	1	2	3	4
74.	I try hard to get good grades	1	2	3	4
C11.	I have much to be proud of	1	2	3	4
12.	Having many friends is important to me	1	2	3	4
13.	I've had few opportunities to demonstrate what I really can do	1	2	3	4
14.	Success is just, "getting up one more time"	1	2	3	4
15.	I usually plan ahead for things	1	2	3	4
16.	I invent new ways to do things	1	2	3	4
17.	I often act completely on impulse	1	2	3	4
18.	It is easy for me to become apathetic and not try things	1	2	3	4
19.	I often do what my friends want to do	1	2	3	4
20.	I am seldom caught unaware	1	2	3	4
21.	Seldom have enough time to finish all I want to do	1	2	3	4
22.	Am always trying new things	1	2	3	4
23.	Often see the humor in tense situations	1	2	3	4
24.	Usually meet deadlines imposed on me	1	2	3	4
25.	Usually respond aggressively in competitive situations	1	2	3	4
26.	I do many things for others	1	2	3	4
27.	I like to know "the rules of the game" before committing myself	1	2	3	4
28.	I usually avoid ambiguous situations	1	2	3	4
29.	Rules are made to be followed	1	2	3	4
30.	I perform best in a tense situation	1	2	3	4

VI

1. Strongly disagree
2. Disagree
3. Agree
4. Strongly agree

PHILOSOPHY ABOUT LIFE

31.	Maintaining the rules of a society is more important than the rights of a single individual	1	2	3	4
32.	An individual to a large degree can control his own destiny	1	2	3	4
33.	There is no final authority concerning moral values	1	2	3	4
34.	Seeking personal happiness is an acceptable end in itself	1	2	3	4
35.	Ideas have value only if they can be put to use	1	2	3	4
36.	Knowledge is open-ended and tentative rather than certain	1	2	3	4
37.	All authority should be open to examination	1	2	3	4
38.	Personal experience is the best basis for making decisions	1	2	3	4
39.	Moral values should change with the times	1	2	3	4
40.	Science provides the best way of explaining the universe	1	2	3	4
41.	Truth is obtainable through the human powers of the intellect	1	2	3	4
42.	A person can never fully experience the feelings of another person	1	2	3	4
43.	Thorough knowledge of the past is a good preparation for the future	1	2	3	4
44.	The world is always in a state of change	1	2	3	4
45.	Technology has made the world a better place to live	1	2	3	4
46.	Most people resist changes in our society	1	2	3	4
47.	An individual should be responsible only to himself for his actions	1	2	3	4
48.	It is immature to believe in something only because ones parents did	1	2	3	4
49.	The universe operates upon discoverable natural laws	1	2	3	4
50.	One gets ahead in society by being truthful	1	2	3	4
51.	There is usually only one "best" answer to a problem	1	2	3	4

1. Very unimportant
2. Unimportant
3. Important
4. Very important

ATTRIBUTES OF A CAREER

52.	Being "on the road" much of the time	1	2	3	4
53.	Remain near friends	1	2	3	4
54.	Able to work when you want	1	2	3	4
55.	Earn considerable money	1	2	3	4
56.	Engage in creative activities	1	2	3	4
57.	Social status and prestige	1	2	3	4
58.	Remain near parents or family	1	2	3	4
59.	Act in a leadership position	1	2	3	4
60.	Have specified and routine activities to perform	1	2	3	4
61.	Work with people rather than things	1	2	3	4
62.	Have a stable and secure future	1	2	3	4
63.	Relatively free from supervision	1	2	3	4
64.	In a position to help others	1	2	3	4
65.	Be your own "boss"	1	2	3	4
66.	Have regular working hours	1	2	3	4
67.	Live in different regions of the country	1	2	3	4
68.	Regular time-in-grade promotions	1	2	3	4
69.	Remain in hometown area	1	2	3	4
70.	In a position to help others from my cultural group	1	2	3	4
71.	Based upon your formal education	1	2	3	4
72.	Opportunity for rapid advancement	1	2	3	4
73.	Obtain enjoyment from my job	1	2	3	4
74.	Work with persons from other cultures	1	2	3	4

CAREER EDUCATION DESCRIPTION QUESTIONNAIRE

VIEW OF EDUCATION

SELF-DEVELOPER:	35, 36, 37, 38, 39, 43, 44, 45, 46
UTILITARIAN:	27, 28, 29, 30, 33, 25* (FROM SELF-CONCEPT SCALE)

STUDY PRACTICES

PREPARATION (SYSTEMATIZER):	47, 56, 57, 58, 65, 66, 67
PROCRASTINATION:	49, 51, 53, 63, 64, 70
INTERACTIVE:	48, 55, 60, 61, 62, 68

SELF-CONCEPT

RISK-TAKING:	13*, 16, 21, 22, 23, 30
PLANNING:	71, 73, 74, 15, 20, 29
SOCIALIZING:	12, 17, 18, 19, 26, 27

PHILOSOPHY OF LIFE

TEMPORAL:	33, 34, 35, 36, 37, 38, 39, 47
RATIONAL:	31, 40, 41, 45, 49, 50

CAREER ATTRIBUTES

ADVANCEMENT:	55, 57, 60, 62, 66, 68, 71, 72
SOCIALLY AWARE:	56, 61, 64, 73, 74
INDEPENDENCE:	52, 63, 65, 67
REGIONAL:	53, 54, 58, 69

*Notice that the numbers repeat. This is because these numbers refer to the column on the data cards of the SBDQ and there are two data cards. See the SBDQ Questionnaire for clarification.

PILOT COURSE IN CENTURY 21 SHORTHAND

BACKGROUND AND STUDY HABITS INFORMATION

Name _____

Social Security Number _____

How many hours per week do you spend in preparing for this course, outside of class?_____

Are you currently enrolled in one or more English courses?

Yes _____ No _____

First English Course: Class Name _____

Class No. _____ Expected Grade _____

Other English Course: Class Name _____

Class No. _____ Expected Grade _____

If you are not currently enrolled in an English course, what grade did you receive in your last English course in college?

Grade _____ Name of Course _____

What is your current Grade Point Average in college? _____
(A = 4.0, B = 3.0, C = 2.0)

What is your expected Grade Point Average for this semester? _____
(A = 4.0, B = 3.0, C = 2.0)

What kind of reading instruction did you have in grammar school?

_____Phonics _____ Look-Say _____Other

Can you remember the name of your reading series?

Please name _____

Publisher (Ginn, Elson, etc.) _____